

Table 2-9. Fairfax County Special Waste Generation (tons)

Waste	1998	1999	2000	2001	2002	Average	Generation rate (lb/c/d)
HHW	193	198	165	178	184	184	0.0010
Tires	—	7,415	11,243	11,639	9,562	9,965	0.0542
Oil	—	8,019	7,208	7,316	—	7,514	0.0412
Antifreeze	—	—	—	920	—	920	0.0050
Batteries	—	482	582	981	—	682	0.0037
Septage	—	—	—	—	75,019	75,019	0.3982
Sludge <sup>a</sup>	—	52,450	55,770	50,270	53,890	53,095	0.2889
Population <sup>b</sup>	962,910	978,038	1,001,624	1,016,406	1,032,205	998,237	

<sup>a</sup> Data represent quantities of sludge prior to incineration

<sup>b</sup> Includes populations of the Cities of Fairfax and Falls Church and the Towns of Herndon, Vienna, and Clifton

**Fairfax County  
collects used tires at  
the I-95 Landfill  
Complex for  
transport to tire  
recyclers.**

### Used Tires

Virginia bans the land disposal of used tires. In addition, the General Assembly enacted a 50¢-per-tire tax (Section 58.1-641 of the Code of Virginia) and directed VDEQ to develop and implement a plan (Section 10.1-1422 of the Code of Virginia) for the transportation and management of all waste tires generated within the state. Virginia temporarily raised the tax to \$1 per tire between July 2003 and July 2006. The revenues are placed in the Waste Tire Trust Fund.



Used tires collected in Fairfax County are recycled for use for civil engineering projects, as a fuel source, and in recycled products, primarily outside of the county. Tire use in civil engineering projects includes landfill daily cover, landfill drainage media, landfill improvements, septic drainfields, golf course drainage, and roadway base. As a fuel source, chipped or shredded tires are used in some waste-to-energy facilities, electricity-generating facilities, pulp and paper mills, and cement kilns. The recycled product uses include mats, highway noise walls, pavement sealers, playground surfaces, brake pads, blasting mats, eco-blocks, and arena footings.

Private haulers collect used tires from auto shops and transport them to the I-95 Landfill Complex. County agencies and cities and towns throughout the county also bring tires to these facilities. Used tires are collected from auto shops by private haulers and transported to the I-95 Landfill Complex. Tires are accepted at the I-95 Landfill Complex and shredded for use or transported to tire recyclers. An unknown quantity of used tires is also transported directly to recycling facilities, bypassing the county collection facilities.

### Generation Rates

Used tire collection and recycling in Fairfax County, as reported by the Fairfax County Division of Solid Waste Collection and Recycling (DSWCR), ranged from 11,243 to 9,562 tons per year from 2000 through 2002. Table 2-9 includes the county collection data for tires.

**Used oil and antifreeze are collected at county facilities, auto shops, and motor pools.**

### Used Oil and Antifreeze

Used oil and antifreeze are accepted at no charge at the citizen's drop-off centers at the I-95 and I-66 locations, as well as by private collection firms and recycling firms that service auto shops and motor pools.



Oil and grease wastes are also generated by restaurants in the county. Although these wastes do not meet the definition of special wastes, they are wastes that are of concern to the Fairfax County community.

### Generation Rates

The DSWCR compiles data from all of these collection sources annually (Table 2-9).

**Alkaline or carbon zinc household batteries may be disposed of with MSW.**

### Batteries



Used automotive batteries are accepted by battery retailers and at the county-run citizen disposal locations at I-95 and I-66. County recycling centers accept button, rechargeable (NiCad), mercury, and lithium batteries. Alkaline and carbon zinc household batteries may be disposed of with MSW.

NiCad batteries could present a significant challenge if they continue to be disposed of as waste in the future. There is the potential for increased amounts of cadmium to be released as the material is either incinerated or landfilled. (See Chapter 9 for recommendations concerning battery recycling.)

### Generation Rates

Table 2-9 includes data for the batteries managed by the county recycling program.

### Septage

Septage is the liquid and solid material pumped from a septic tank, cesspool, or other treatment facility after it has accumulated over a period of time. Much of it is collected from homes that do not have sanitary sewers. A septic tank usually retains 60 to 70 percent of the solids, oil, and grease that enter it. *Septage does not include sludge from sanitary sewers.*

**Septage is generated from the 13 percent of county households not connected to the public sewer system.**

Approximately 13 percent of the county's 360,000 households are not connected to the public sewer system. Septage from these residences is collected by private haulers and discharged at the Noman M. Cole, Jr. Pollution Control Plant, the Colvin Run Discharge Station, or the Upper Occoquan Sewage Authority Plant.

#### *Generation Rates*

Septage generation has remained relatively constant over the preceding years (Table 2-9). The county predicts septage generation will increase at the same rate as population growth as development increases in areas outside of sewer service areas.

**Sludge is generated by the county's wastewater treatment plant and incinerated on-site.**

#### **Sludge**



The Noman M. Cole Plant currently treats 54 million gallons of wastewater per day generated in Fairfax County using preliminary, primary, secondary, and tertiary treatment processes. Sludge is collected at the facility and dewatered to 30 percent solids before incineration on-site. The ash residue is

disposed of in the I-95 Complex ash landfill. Sludge is also generated at the Upper Occoquan Sewage Authority's (UOSA) Regional Water Reclamation Plant and landfilled on-site.

#### *Generation Rates*

Sludge generation has remained relatively constant over the preceding years (Table 2-9). The county predicts sludge generation will increase at the same rate as population growth over the SWMP planning period.

## **Solid Waste Generation Projections**

### **Approach**

#### **Method**

For each major solid waste category, the county established a per capita generation rate on the basis of available historical records of waste generation and disposal over the preceding five years. The county then used the generation rates in conjunction with county population projections to estimate waste volumes for the 20-year planning period. The county adjusted these generation rates over the planning period in response to projected impacts of urbanization, intensity of construction activity, economic growth, and recycling trends.

The county established generation factors by adding total annual county waste disposed of and total county waste recycled in each waste category, and dividing by the county population for the year under consideration. The county evaluated the trend in the generation rate over the five-year period using the factors mentioned above to determine



**The waste projections assume the continuation of the county's current waste management practices.**

generation rates to be used over the 20-year planning period.<sup>4</sup> *The waste and recycling projections throughout this chapter assume the continuation of the county's current waste management practices and conditions, unless otherwise stated.*

### **Sources of Information**

The Fairfax County Division of Solid Waste Disposal and Resource Recovery (DSWDRR) maintains a detailed report (known as the 904 Report) on MSW quantities accepted at the I-66 Transfer Station and E/RRF. The 904 Report documents annual quantities of MSW generated within the county that were ultimately disposed of by either incineration or landfill. Records maintained by the county DSWCR were used to determine annual county recycling quantities, including yard waste, tires, used oil, antifreeze, and batteries.

For CDD, the county used reports published by the VDEQ on annual tonnages accepted by CDD landfills in conjunction with interviews with the CDD landfill and transfer facility operations personnel. Operations personnel estimated historical waste tonnage accepted and the percentage of waste receipts originating in Fairfax County.

The county maintains records of annual quantities of HHW it collects at the I-66 Transfer Station and I-95 Landfill Complex. No data were available for RMW generation and disposal in Fairfax County; the county projected RMW from statewide data collected by VDEQ and included in the report *Solid Waste Managed in Virginia During Calendar Year 2002*. The only RMW facility in Fairfax County is the autoclave/microwave treatment facility at INOVA Fairfax Hospital.

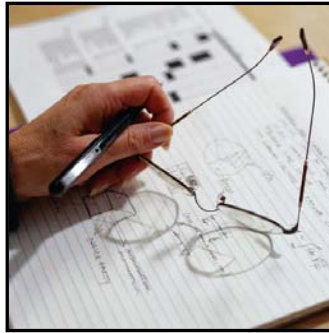
The Noman M. Cole Plant and the Upper Occoquan Sewage Authority Data maintain records for annual quantities of septage collected in the county. The county based annual quantities of sludge generated on ash generation data from the Noman M. Cole Plant documented in the 904 Report. Sludge quantities were calculated using the Cole facility estimate of a 90 percent reduction in sludge weight during incineration.

Fairfax County generates minimal reportable agricultural wastes, mining wastes, and spill residues. Since the county does not expect the annual generation quantities of these wastes to increase, the SWMP does not include waste projections for these special wastes.

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<sup>4</sup> For this report, solid waste generated by the county includes wastes generated by the Cities of Fairfax and Falls Church and the Towns of Vienna, Clifton, and Herndon.

## MSW Generation Forecasts



The county based waste generation projections on the predicted per capita MSW generation rate and population projections for the planning period. In addition, employment projections may be used to predict commercial waste generation, as discussed later in this section.

For projections of recycling quantities, the county forecasted its recycling rate to increase from 32 percent to 35 percent over the SWMP planning period. Although its 2002 recycling rate was 32 percent, the county has consistently achieved 35 percent recycling using current solid waste management practices. Therefore, the county projects that the recycling rate will gradually increase from 32 percent to 33.5 percent in 2010, and finally to 35 percent in 2015 and beyond.

### Fairfax County Waste Generation Rate

Based upon the average of the past three years, the waste generation rate for Fairfax County is 6.30 pcd. Appendix C contains further analysis of the historical basis for the county's waste generation rate.

### Regional and National Per Capita Generation Data

The estimated MSW generation rate in Fairfax County is higher than national and regional generation rate estimates. Nationally, the MSW generation rate has remained constant at 4.51 pcd in both 2000 and 1990. Regionally, the MWCOG report indicated an MSW generation rate of 5.8 pcd for the Washington metropolitan area.

### MSW Projections

From the differing trends and estimates of MSW generation in the county, the county developed four alternative MSW projections to address the probable range of variance in the future generation rates. Table 2-10 presents the projections of MSW generation and disposal for these four alternatives over the next 20 years. Appendix C details the development of Fairfax County's MSW projections.

**Fairfax County developed four alternative projections for MSW to address the probable range of variance in future waste generation rates.**



Table 2-10. Fairfax County MSW Generation and Disposal Projections (thousands of tons)

Year	Alternative 1		Alternative 2		Alternative 3		Alternative 4	
	MSW generation	MSW disposal	MSW generation	MSW disposal	MSW generation	MSW disposal	MSW generation	MSW disposal
2004	1,223	832	1,248	848	1,264	859	1,289	877
2005	1,241	844	1,279	870	1,280	871	1,319	897
2010	1,322	879	1,431	952	1,384	921	1,499	997
2015	1,363	886	1,551	1,008	1,432	931	1,630	1,059
2020	1,392	904	1,664	1,082	1,479	962	1,770	1,150
2025	1,406	914	1,768	1,149	1,519	987	1,909	1,241

**MSW disposal quantities are projected to range from 832,000 to 1,241,000 tons from 2004 to 2025 depending on the year and projection assumptions.**



Fairfax County projects its annual MSW disposal quantities will range from 832,000 tons to 1,241,000 tons between 2004 and 2025, depending on the year and assumptions used for the calculation. Clearly, waste will increase with increases in population and employment. The rate of increase depends on recycling rates and costs for disposal. If recycling rates

increase, the county's MSW disposal requirements will be lower. Also, if disposal costs increase enough, MSW disposal quantities will decrease as residents and businesses find other less costly ways to manage their waste.

### Yard Waste and Special Wastes

The county also developed waste projections for two components of MSW, yard waste and special wastes. Yard waste projections are discussed below; special waste projections are discussed later in this chapter.

Yard waste projections are based on the county's 1990 municipal waste composition study that estimated yard waste as 9.4 percent of the MSW stream. Using this percentage and the above MSW projections, the county estimated yard waste generation over the SWMP planning period for the four MSW projection alternatives. Table 2-11 shows the results. (Yard waste is a component of MSW, and these projections are also included in the MSW projections.)



Table 2-11. Fairfax County Yard Waste Generation Projections  
(thousands of tons)

Year	Alternative 1	Alternative 2	Alternative 3	Alternative 4
2004	115	117	119	121
2005	117	120	120	124
2010	124	135	130	141
2015	128	146	135	153
2020	131	156	139	166
2025	132	166	143	179

**Fairfax County developed two alternative projections for CDD to address the probable range of variance in future waste generation rates.**

### CDD Generation Forecasts



Fairfax County developed two alternatives for CDD generation projections (Tables 2-12 and 2-13). The first alternative uses a constant generation rate, which is based on the five-year Fairfax County generation rate average of 4.14 pcd. The second alternative assumes the current trend in generation rates will continue over

the planning period, with the current rate declining at 1 percent per year. Construction activity in the county has been at a high level in recent years, and it is likely to lessen over the planning period; therefore, a reduction in the per capita CDD generation rate for the county is probable.

Table 2-12. Fairfax County CDD Generation Projections 2004–2025 (in thousands of tons), Alternative 1: Generation Rate Remains Constant

Year	Population	Waste generation rate (pcd)	CDD projection (tons)
2004	1,063,735	4.14	803,250
2005	1,079,600	4.14	815,230
2010	1,149,500	4.14	868,013
2015	1,185,400	4.14	895,122
2020	1,210,300	4.14	913,924
2025	1,223,100	4.14	923,590

*Table 2-13. Fairfax County CDD Generation Projections 2004–2025  
(in thousands of tons), Alternative 2: Generation Rate Decreases at 1  
Percent per Year*

Year	Population	Waste generation rate (pcd)	CDD projection (tons)
2004	1,063,735	4.06	787,265
2005	1,079,600	4.01	791,017
2010	1,149,500	3.82	800,954
2015	1,185,400	3.63	785,488
2020	1,210,300	3.45	762,683
2025	1,223,100	3.28	732,974

Events such as a significant increase in CDD tipping fees due to disposal capacity restrictions could result in a reduced disposal rate. In addition, operation of a CDD reuse or recycling center may reduce the disposal rate.

### Special Waste Generation Forecasts

Table 2-14 shows projected generation quantities for each special waste category. The generation rate is based on the county average annual generation over the preceding five years, divided by the average population for that period. For septage, data for a major collection point, Colvin Run, were only available for 2002; therefore, we used data from that year only in the septage generation forecast

*Table 2-14. Fairfax County Special Waste Generation Projections 2004–2025 (tons)*

Waste	Gen. rate (pcd)	2004	2005	2010	2015	2020	2025
HHW	0.0010	196	199	212	219	223	225
Tires	0.0542	10,526	10,683	11,374	11,730	11,976	12,103
RMW	0.0174	3,386	3,436	3,659	3,773	3,853	3,893
Oil	0.0412	8,004	8,123	8,649	8,920	9,107	9,203
Antifreeze	0.0050	963	977	1,041	1,073	1,096	1,107
Batteries	0.0037	726	737	785	809	826	835
Septage	0.3982	77,311	78,464	83,544	86,153	87,963	88,893
Sludge	0.2889	56,083	56,919	60,604	62,497	63,810	64,485
Population		1,063,735	1,079,600	1,149,500	1,185,400	1,210,300	1,223,100